Amplifier 70FA630/00R/05R

70FA650/00R/05R

Service
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Service Manual

FA630/00R/05R
FA650/00R/05R

Table of contents **page**

Specification, standard symbollist	1
Connections and controls	2
Mains voltage changeover method	3
Adjustment of the idling current	4
Schematic diagrams FA630,FA650	5, 6, 7, 11, 12, 13
Wiring diagrams FA630, FA650	8, 9, 14, 15
Semiconductor layout	10
Exploded view FA630, list of mechanical parts	16, 17
Exploded view FA650, list of mechanical parts	18, 19
List of electrical parts	20

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde worden toegepast.

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati pezzi di ricambiago identici a quelli specificati.

(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

Subject to modification
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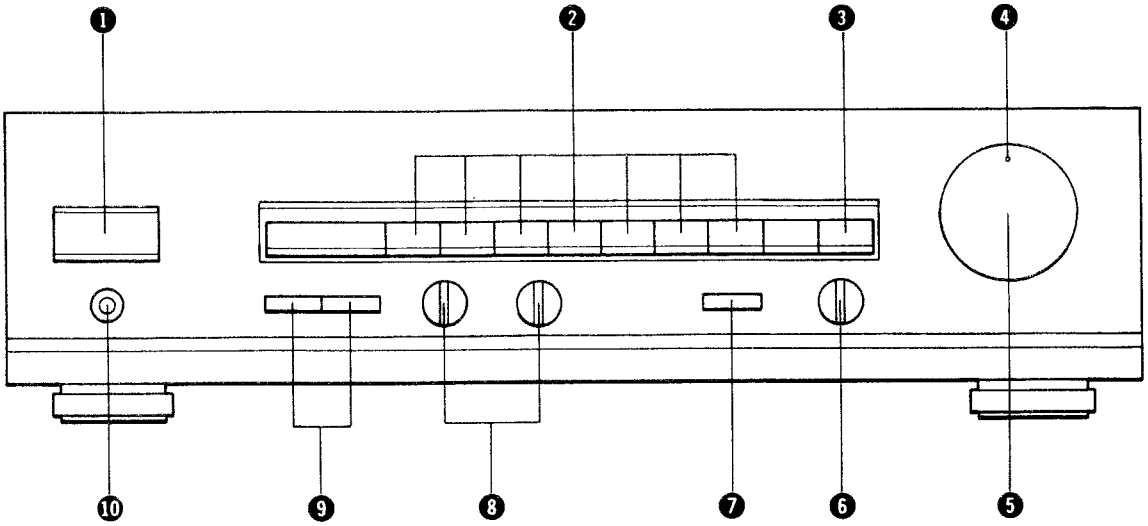
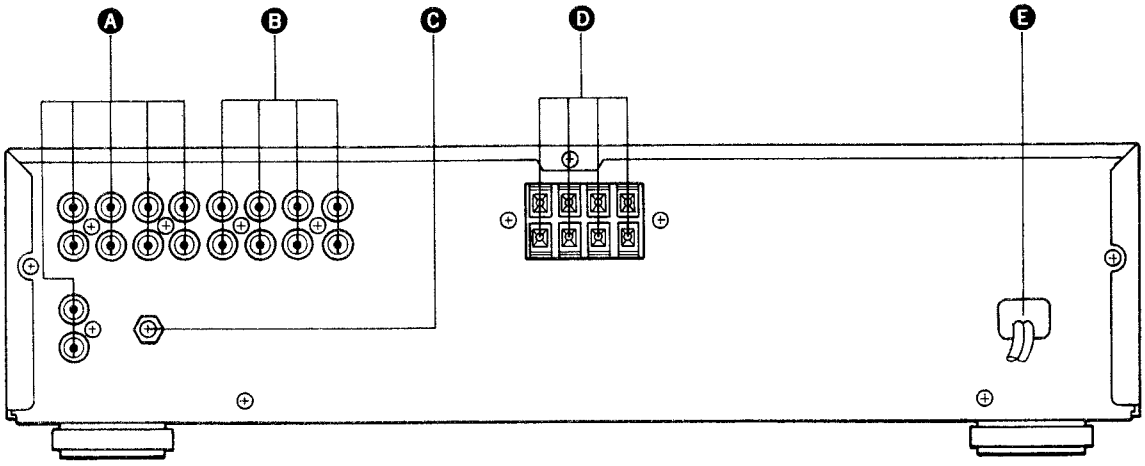
SPECIFICATION

General		Nominal value	Typical value
Mains voltage		: 220V ~ (/00R)	: 220V ~ (/00R)
		: 240V ~ (/05R)	: 240V ~ (/05R)
Mains frequency		: 50 – 60 Hz	: 50 – 60 Hz
Power consumption	FA630/FA650	: 140W/200W	: 140W/200W
Dimensions (WxHxD)		: 420 x 100 x 260 mm	: 420 x 100 x 260 mm
Weight	FA630/FA650	: 4.9 kg/6.0 kg	: 4.9 kg/6.0 kg
Amplifier			
Output power	FA630/FA650	: 27W/44W in 8Ω (IEC)	: 29W/48W in 8Ω (IEC)
Distortion	(FA630: 25W output / FA650: 40W output)		
T.H.D.		: ≤ 0.05% at 1 kHz	: ≤ 0.008% at 1 kHz
		: ≤ 0.05% at 63 Hz – 12.5 kHz (IEC)	: ≤ 0.035% at 65 Hz – 12.5 kHz (IEC)
Intermodulation		: ≤ 0.05% at 60/7000 Hz 4:1	: ≤ 0.03% at 60/7000 Hz 4:1
Frequency characteristic			
Phono input	tone control	: from 20 Hz – 20 kHz ±1 dB (IEC)	: from 20 Hz – 20 kHz ±0.5 dB (IEC)
Other inputs	neutral	: from 20 Hz – 30 kHz ±1 dB	: from 15 Hz – 45 kHz ±1 dB
Bass control		: at 63 Hz +10 dB to –10 dB ±2 dB	: at 63 Hz +10 dB to –10 dB
Treble control		: at 12.5 kHz +10 dB to –10 dB ±2 dB	: at 12.5 kHz +10 dB to –10 dB
Loudness		: at 100 Hz +6 dB ±2 dB (Tap position)	: at 100 Hz +6 dB (Tap position)
		: at 10 kHz +4 dB ±1.5 dB (Tap position)	: at 10 kHz +4 dB (Tap position)
Signal/noise ratio weighted (A-curve)			
Phono input (5 mV input)	FA630	: for 25W output ≥ 72 dB	: for 25W output ≥ 76 dB
	FA650	: for 40W output ≥ 76 dB	: for 40W output ≥ 80 dB
Other inputs (500 mV input)	FA630	: for 25W output ≥ 90 dB	: for 25W output ≥ 96 dB
	FA650	: for 40W output ≥ 92 dB	: for 40W output ≥ 96 dB
Channel separation		: at 1000 Hz ≥ 56 dB	: at 1000 Hz ≥ 60 dB
		: at 250 Hz – 10 kHz ≥ 40 dB	: at 250 Hz – 10 kHz ≥ 45 dB
Input sensitivity/Input impedance			
Audio			
Phono		: 2.6 mV ± 0.3 mV/47 kΩ ± 5 kΩ	: 2.6 mV/47 kΩ
Other inputs		: 150 mV ± 20 mV/≥ 30 kΩ	: 150 mV/40 kΩ
Output level/Output impedance			
Tape 1, 2		: 250 mV/270Ω (Phono 5.0 mV 1 kHz input)	: 280 mV/270Ω (Phono 5.0 mV 1 kHz input)





CONNECTIONS AND CONTROLS

1	Mains switch	S901
2	Function switch (Aux switch: only for FA650)	SS01
3	Loudness switch	SG01
4	Volume/Power indicator	DY51
5	Volume control	RG51
6	Balance control	RE25
7	Source direct switch	SE01
8	Tone control	RE23, RE24
9	LS switch	S701
10	Phones socket	JW51

A	Input (Aux input: only for FA650)	J401, JV01, JV02
B	Tape input/output	JJ01, JJ02
C	Ground terminal	J031
D	LS output A/B	JW01
E	Mains cord	W001

(GB) Mains voltage changeover method

To make the unit usable with the other local mains voltage than the factory setting, modify the lead wire connection on the primary side of the power transformer as follows.

1. With units of the /00R version, the rated voltage is 220V. To change the mains voltage for the unit to the same 240V as the /05R version, exchange the connections of the White and Red lead wires.
2. With units of the /05R version, the rated voltage is 240V. To change the mains voltage for the unit to the same 220V as the /00R version, exchange the connections of the Red and White lead wires.
3. If the unit has already experienced the voltage changeover of 1 or 2 above, confirm which of the Red (240V) or White (220V) lead wires is connected to the fuse (F901) before attempting to change the connections.

(F) Méthode de changement de la tension

Pour rendre l'appareil utilisable sur une autre tension secteur locale que celle réglée en usine, modifier la connexion du fil conducteur sur le côté primaire du transformateur d'alimentation comme suit.

1. Sur les appareils de la version /00R, la tension nominale est de 220V.
   Pour changer la tension secteur de l'appareil sur les 240V comme pour la version /05R, changer les connexions des fils conducteurs blanc et rouge.
2. Sur les appareils de la version /05R, la tension nominale est de 240V.
   Pour changer la tension secteur de l'appareil sur les 220V comme pour la version /00R, changer les connexions des fils conducteurs rouge et blanc.
3. Si l'appareil a déjà subi le changement de tension de 1 ou 2 ci-dessus, vérifier le fil conducteur, rouge (240V) ou blanc (220V), raccordé au fusible (F901) avant de tenter de changer les connexions.

(NL) Methode voor instellen op de netspanning

Verander de aansluiting van de draden op de primaire kant van de transformator als volgt om het toestel geschikt te maken voor werking op een andere netspanning dan die waarop het toestel bij levering op ingesteld staat.

1. Bij toestellen van de /00R versie, is de nominale spanning 220V.
   Verwissel de aansluiting van de witte en rode draden om het toestel aan te passen voor 240V zoals de toestellen van de /05R versie.
2. Bij toestellen van de /05R versie, is de nominale spanning 240V.
   Verwissel de aansluiting van de rode en witte draden om het toestel aan te passen voor 220V zoals de toestellen van de /00R versie.
3. Als het toestel reeds eenmaal aangepast is volgens bovenstaande procedure 1 of 2, kontroleer dan of de rode (240V) of witte (220V) draad aangesloten is op de zekering (F901) alvorens de aansluiting om te wisselen.

(D) Methode zum Umstellen der Netzspannung

Zur Verwendung dieses Gerätes mit anderen Netzspannungen als der ab Werk eingestellten, müssen die Kabelanschlüsse an der Primärseite des Netztransformators wie folgt verändert werden.

1. Bei Geräten der Version /00R ist die Nennspannung 220V.
   Zum Umstellen der Netzspannung des Gerätes auf 220V wie bei der Version /05R müssen die Anschlüsse des weißen und des roten Kabels ausgetauscht werden.
2. Bei Geräten der Version /05R ist die Nennspannung 240V.
   Zum Umstellen der Netzspannung des Gerätes auf 240V wie bei der Version /00R müssen die Anschlüsse des roten und des weißen Kabels ausgetauscht werden.
3. Falls beim Gerät bereits die unter 1 oder 2 beschriebene Spannungsumstellung durchgeführt wurde, muß festgestellt werden, ob das rote Kabel (240V) oder das weiße Kabel (220V) mit der Sicherung (F901) verbunden ist, bevor die Anschlüsse vertauscht werden.

(I) Metodo di regolazione del voltaggio di rete

Per poter utilizzare l'unità con voltaggi di rete diversi da quello previsto in fabbrica, modificate il collegamento dei fili sul lato primario del trasformatore di potenza nel modo che segue.

1. Per le unità della versione /00R, il voltaggio normale è di 220V.
   Per cambiare il voltaggio dell'unità ai 240V della versione /05R, cambiate le posizioni dei fili bianco e rosso.
2. Per le unità della versione /05R, il voltaggio normale è di 240V.
   Per cambiare il voltaggio dell'unità ai 220V della versione /00R, cambiate le posizioni dei fili rosso e bianco.
3. Se il voltaggio dell'unità è stato già cambiato come visto ai punti 1 o 2, controllate quale dei due fili rosso (240V) o bianco (220V) è collegato al fusibile (F901) prima di cambiare i collegamenti.

Idling Current

SK... SWITCH	SIGNAL	TO	VOLUME	ADJUST	OSCILLOSCOPE	D.C. METER INDICATOR
			Min.	Rch R718		Rch TP2(+), TP4(–) DC2.5mV (6.9mA)
				Lch R717		Lch TP1(+), TP3(–) DC2.5mV (6.9mA)

(GB) Notes:

- 1 minute after the power has been switched ON, adjust to read 2.5 mV DC.
- If the heat-sink temperature is higher than the ambient temperature, switch the power OFF, and leave the unit until the heat-sink temperature falls equal to or below the ambient temperature before proceeding to the idling current adjustment.
- For the idling current adjustment, adjust the R channel first, then the L channel.

(F) Remarques:

- 1 minute après avoir fourni l'alimentation, ajuster pour lire 2,5 mV CC.
- Si la température de la plaque de refroidissement est supérieure à la température ambiante, couper l'alimentation et laisser l'appareil jusqu'à ce que la température de la plaque de refroidissement soit égale ou inférieure à la température ambiante avant de passer à l'ajustement du courant déwatté.
- Pour le réglage de la puissance réactive, ajuster le canal R (droit) en premier lieu, puis le canal L (gauche).

(NL) Opmerkingen:

- Maak de instelling zodanig dat 2,5 mV gelijkstroom aangegeven wordt na 1 minuut nadat de spanning ingeschakeld wordt.
- Als de temperatuur van de warmteput hoger is dan de omringende temperatuur, schakel dan de spanning uit totdat de temperatuur van de warmteput gelijk is aan of lager is dan de omringende temperatuur alvorens over te gaan tot aanpassen op de stationaire stroom.
- Bij het afstellen van de blinde stroom moet eerst het R-kanaal worden afgesteld en daarna het L-kanaal.

(D) Anmerkungen:

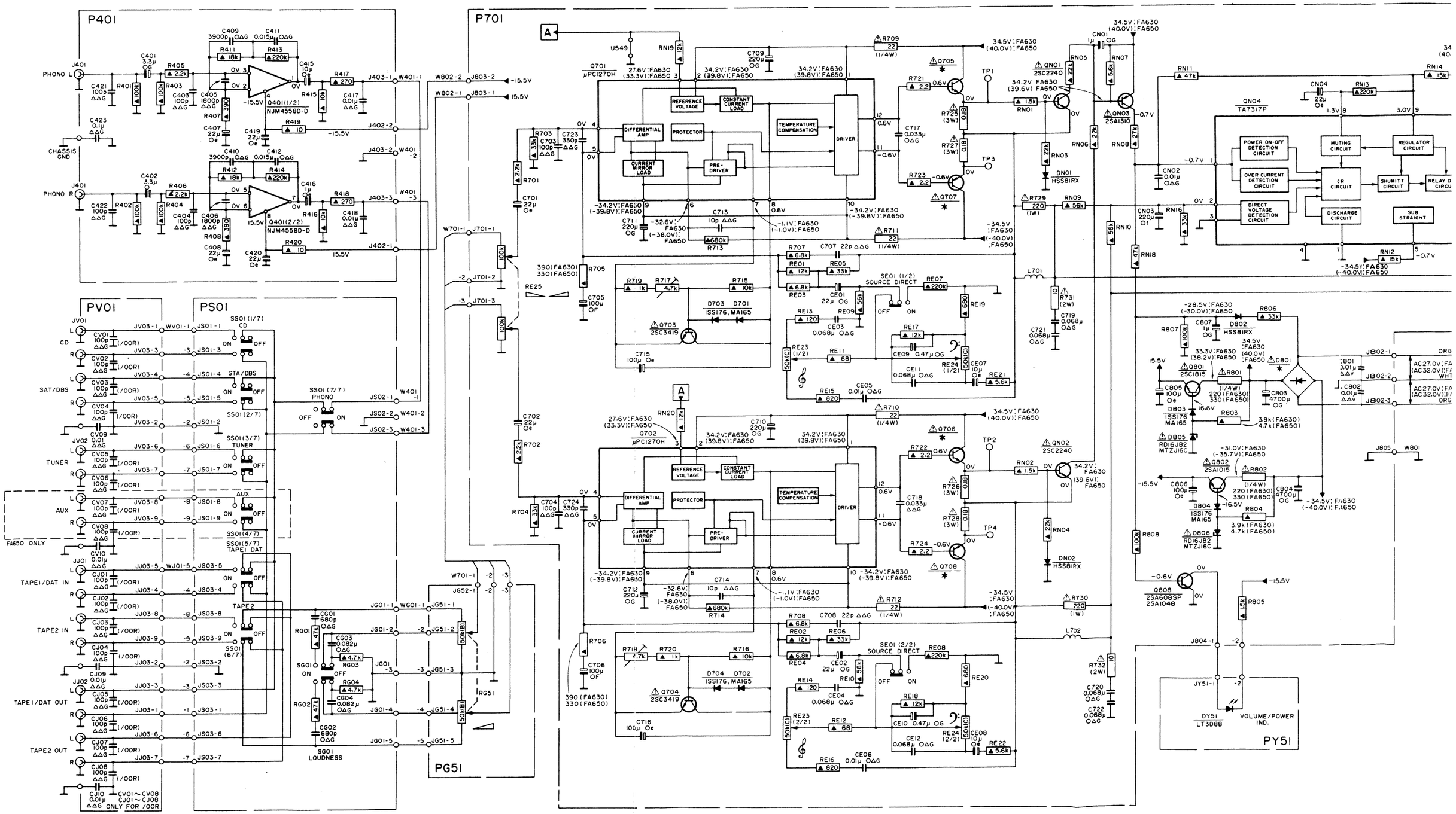
- 1 Minute nach Einschalten der Spannungsversorgung so einstellen, daß 2,5 mV Gleichstrom angezeigt wird.
- Wenn die Temperatur des Kühlkörpers höher ist als die Umgebungstemperatur, die Spannungsversorgung ausschalten und warten, bis die Temperatur des Kühlkörpers gleich der oder niedriger als die Umgebungstemperatur wird, bevor die Ruhestrom-Einstellung durchgeführt wird.
- Für die Ruhestrom-Einstellung zuerst den rechten und dann den linken Kanal einstellen.

(I) Note:

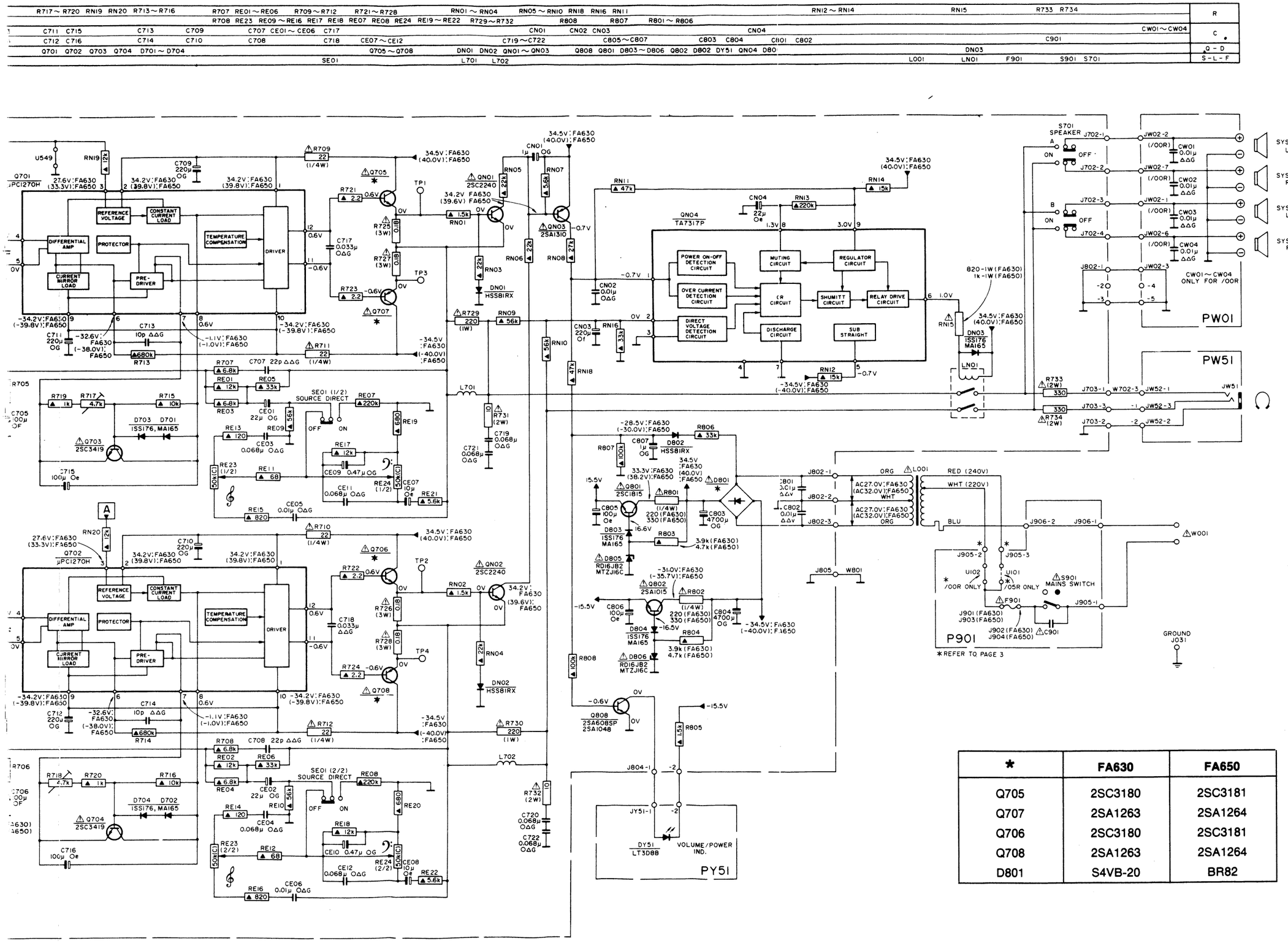
- Fate in modo da ottenere un valore di 2,5 mV di c.c. un minuto dopo l'accensione.
- Se la temperatura degli organi di dispersione del calore è superiore a quella dell'ambiente, spegnete l'unità e lasciatela raffreddare sino a che la sua temperatura non diviene uguale o inferiore a quella ambiente, quindi procedete con la regolazione della corrente a riposo.
- Per la regolazione della corrente reattiva, regolare prima il canale destro R e quindi il canale sinistro L.

SCHEMATIC DIAGRAM(FA630/FA650)

R	R401～R406 R407 R408 R411～R414 R415～R420 R701～R706 R717～R720 RN19 RN20 R713～R716 R707 RE01～RE06 R709～R712 R721～R728 RN01～RN04 RN05～RN10 RN18 RN16 RN11 RN12～RN14
	RG01～RG04 RG51 RE25 R708 RE23 RE09～RE16 RE17 RE18 RE07 RE08 RE24 RE19～RE22 R729～R732 R808 R807 R801～R806
C	C421～C423 C401～C404 C405～C410 C419 C420 C411 C412 C415～C418 C701～C706 C723 C711 C715 C713 C709 C707 CE01～CE06 C717 CN01 CN02 CN03 CN04
	CV01～CV10 CJ01～CJ10 CG01～CG04 C724 C712 C716 C714 C710 C708 C718 CE07～CE12 C719～C722 C805～C807 C803 C804 CH01 CB02
Q - D	Q401 Q701 Q702 Q703 Q704 D701～D704 Q705～Q708 DN01 DN02 QN01～QN03 Q808 Q801 D803～D806 Q802 D802 DY51 QN04 D80
S - L - F	SS01 SG01 SE01 L701 L702



SCHEMATIC DIAGRAM(FA630/FA650)

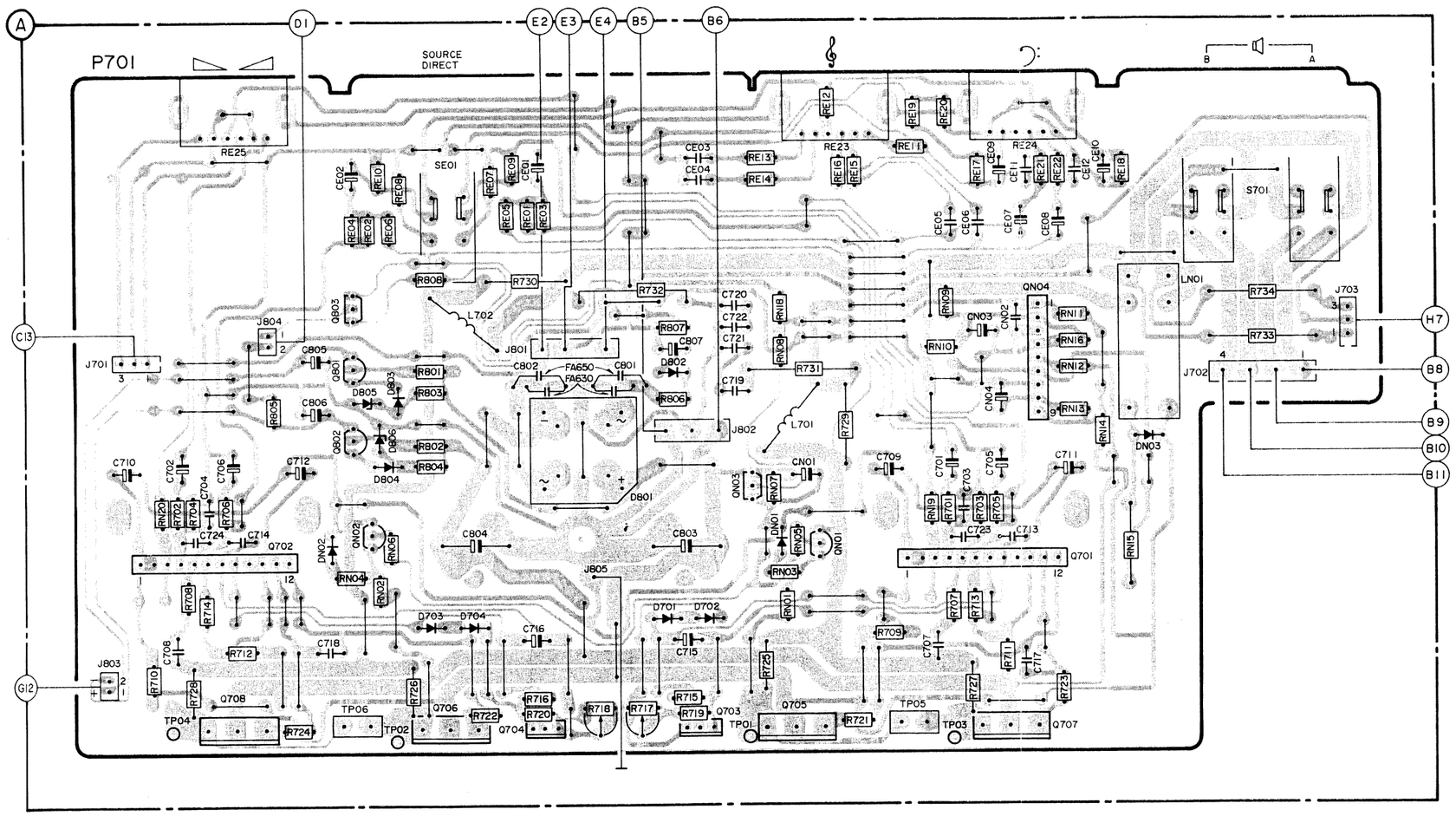


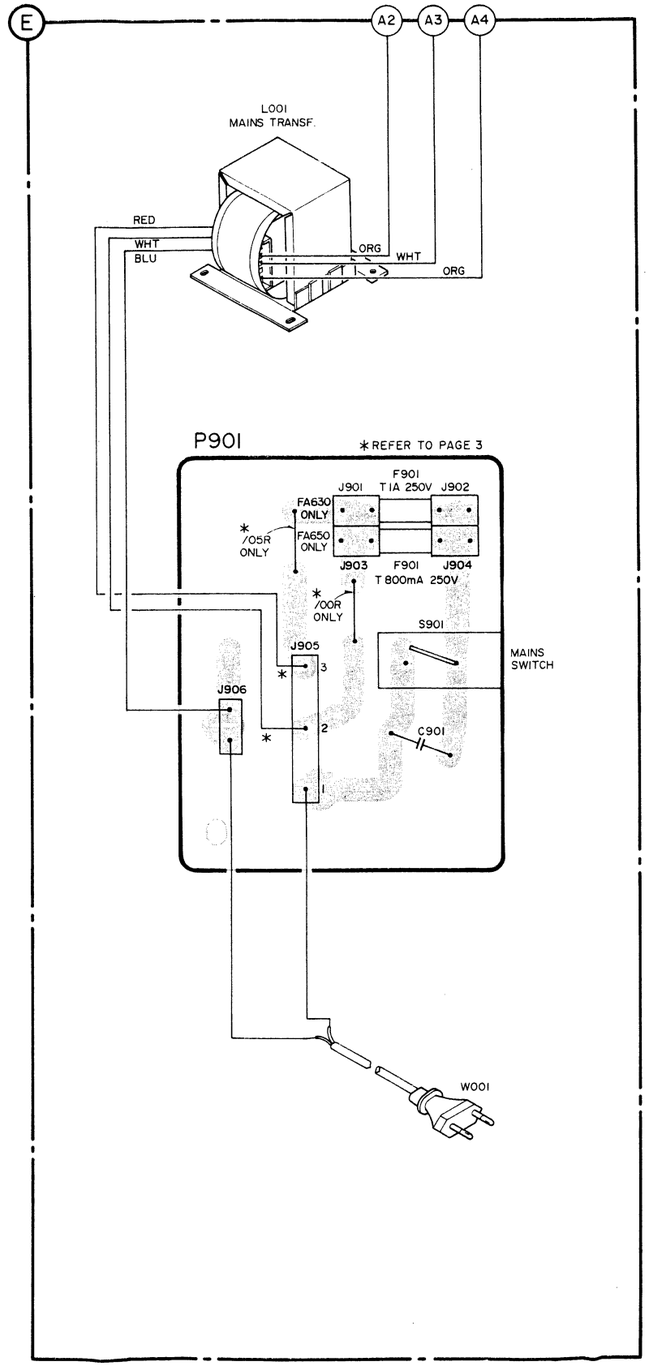
*	FA630	FA650
Q705	2SC3180	2SC3181
Q707	2SA1263	2SA1264
Q706	2SC3180	2SC3181
Q708	2SA1263	2SA1264
D801	S4VB-20	BR82

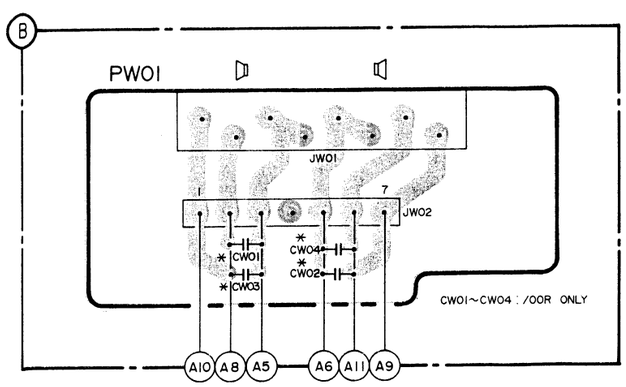
WIRING DIAGRAM(FA630/FA650)

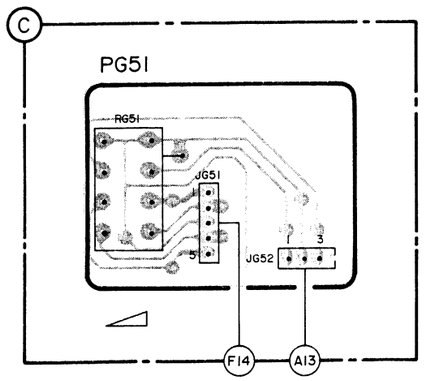
R	RN20 R702 R704 R706 RE25 R805 RE04 RE02 RE10 RE06 RE08 R808 RE07 RE05 RE09 RE01 RE03 R730 RN18 RN08 RE12 ~ RE16 RE23 R731 RE11 RE19 RE20 RN09 RN10 RE17 RE24 RE21 RE22 RE18 RN11 ~ RN16 R733 R734	R
	R710 R708 R728 R714 R712 R724 RN04 RN02 RN06 R726 R801 ~ R804 R722 R716 R720 R718 R717 R715 R719 RG51 RN07 R725 RN03 RN01 RN05 R729 R721 R709 RN19 R701 R707 R703 R705 R713 R727 R711 R723	
C	C710 C702 C724 C704 C706 C714 C712 C805 C806 CE02 CE01 C802 C801 C807 CE03 CE04 C719 ~ C722 CN02 ~ CN04 CE05 ~ CE12	C
	C708 CW01 ~ CW04 C718 C804 C716 C803 C715 CN01 C709 C707 C701 C723 C703 C705 C713 C717 C711 C901	
Q	Q801 ~ Q803 QN03 QN01 QN04	Q
	Q708 Q702 QN02 Q706 Q704 Q703 Q705 Q707 Q701	
D	DN02 D803 ~ D806 D703 D704 D801 D802 D701 D702 DN01 DN03 DY51	D
F-L-S	SE01 L702 L701 LN01 S701 L001 F901 S901	F-L-S

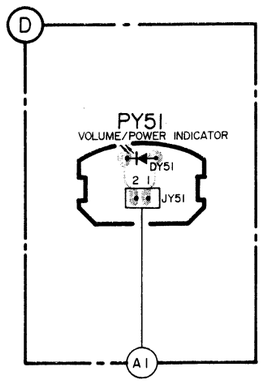
COMPONENT SIDE VIEW





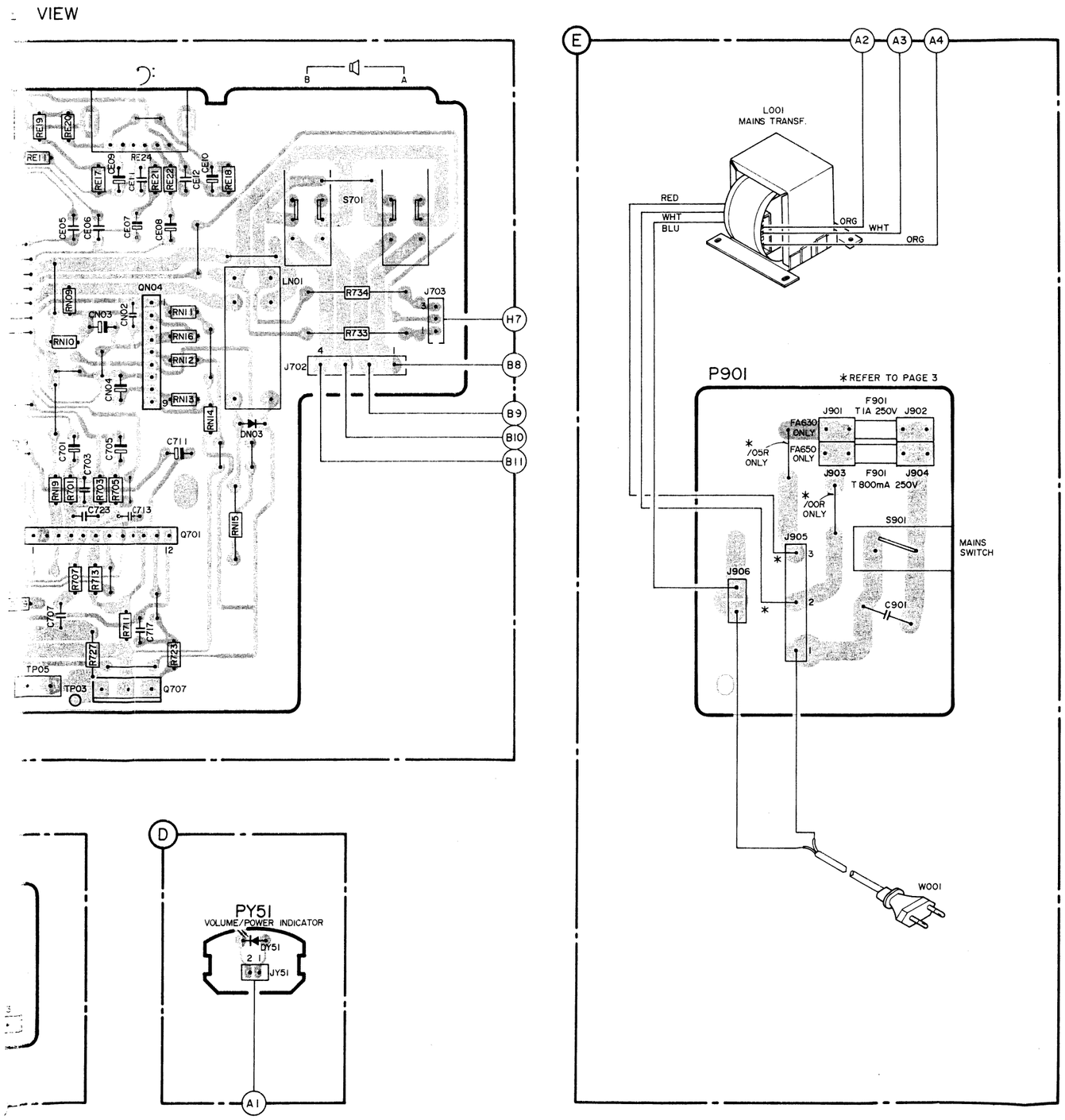




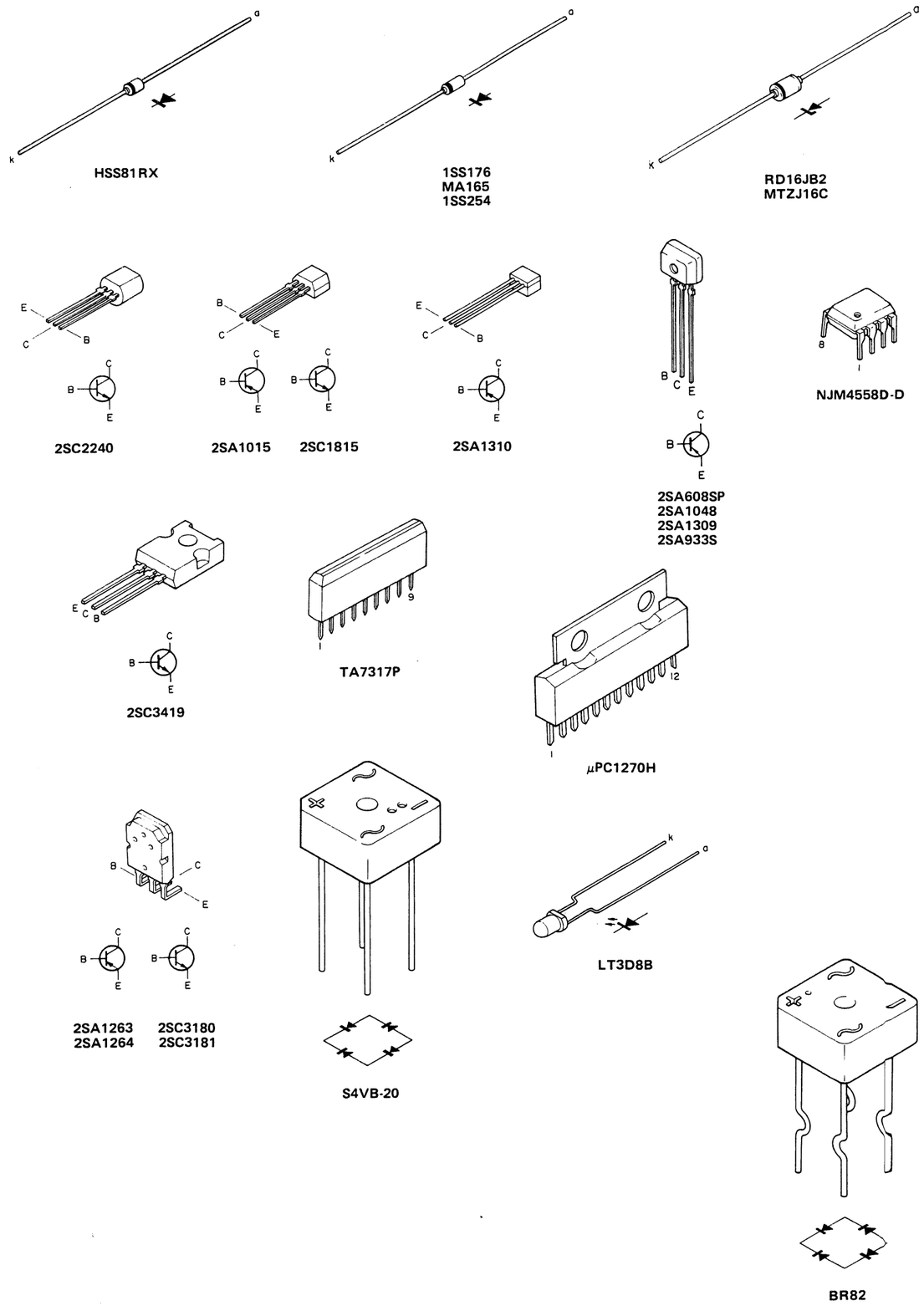


WIRING DIAGRAM(FA630/FA650)

20 RN09 RN10 RE17 RE24 RE21 RE22 RE18 RN11 ~ RN16 R733 R734	R
709 RN19 R701 R707 R703 R705 R713 R727 R711 R723	
CN02 ~ CN04 CE05 ~ CE12	C
709 C707 C701 C723 C703 C705 C713 C717 C711 C901	
QN04	Q
Q707 Q701	
DN03 DY51	D
LN01 S701 L001 F901 S901	F-L-S

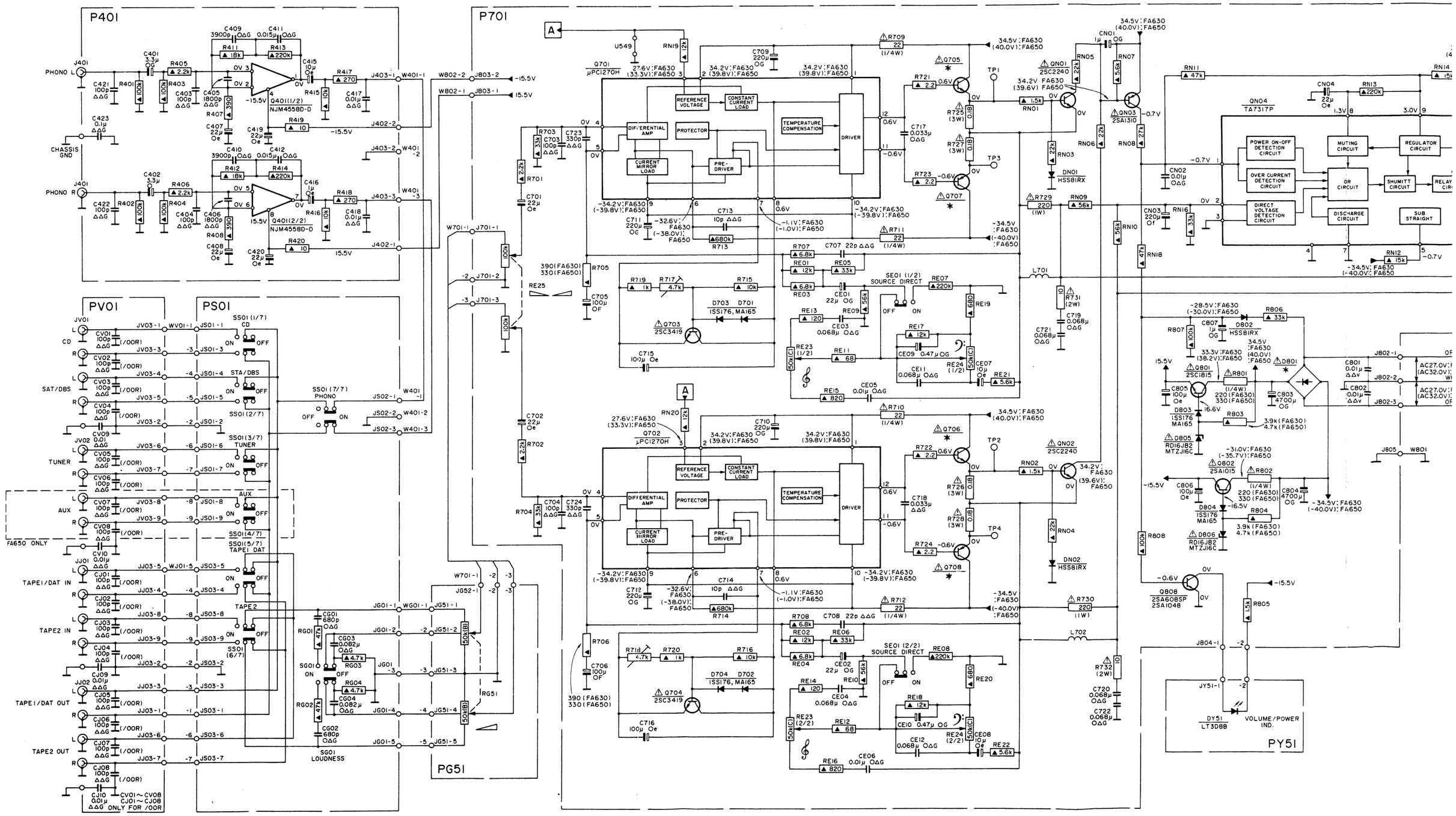


Semiconductor Layout

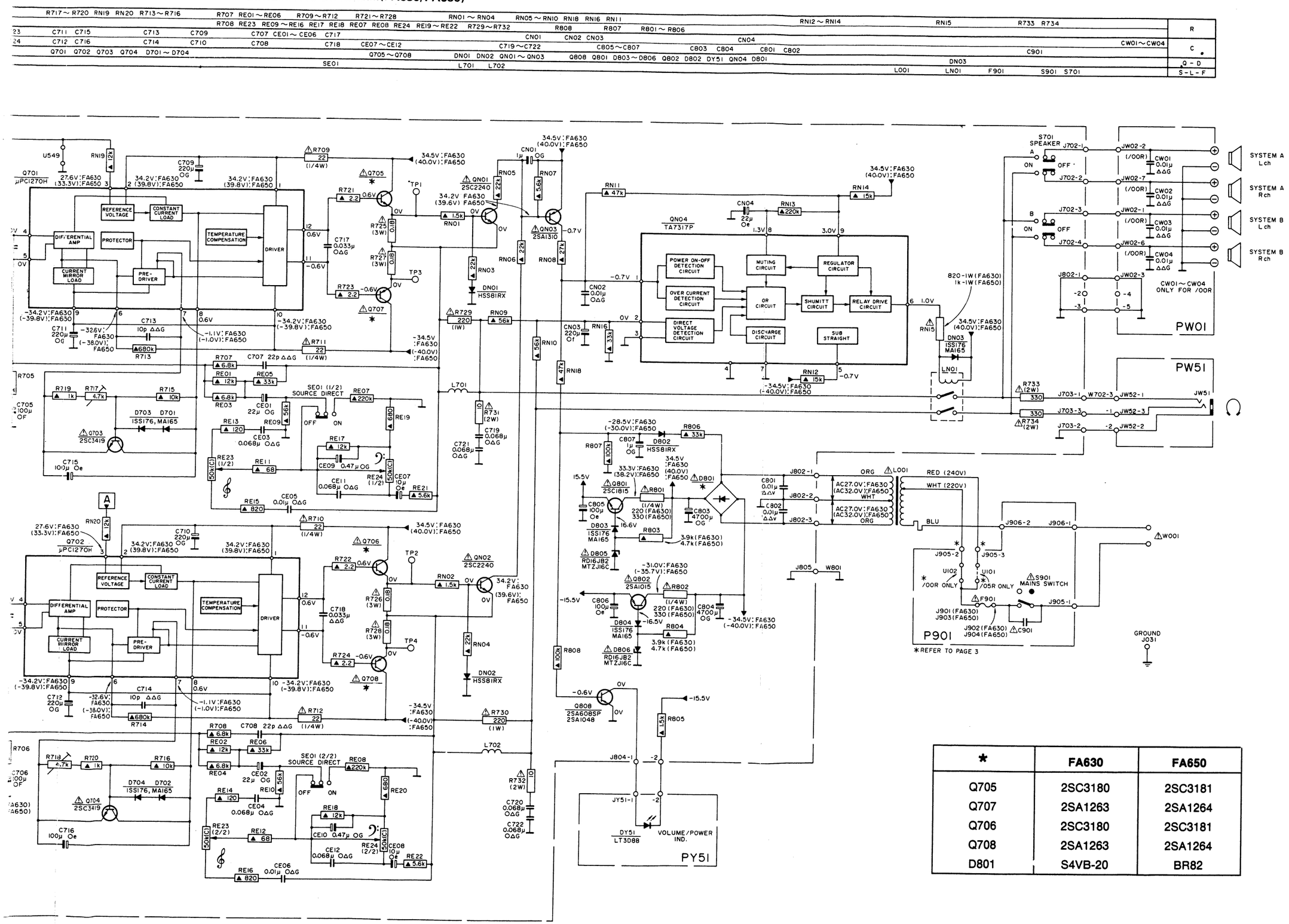


SCHEMATIC DIAGRAM(FA630/FA650)

R	R401～R406 R407 R408 R411～R414 R415～R420 R701～R706 R717～R720 RN19 RN20 R713～R716 R707 RE01～RE06 R709～R712 R721～R728 RN01～RN04 RN05～RN10 RN18 RN16 RN11 RN12～RN14
	RG01～RG04 RG51 RE25 R708 RE23 RE09～RE16 RE17 RE18 RE07 RE08 RE24 RE19～RE22 R729～R732 R808 R807 R801～R806
C	C421～C423 C401～C404 C405～C410 C419 C420 C411 C412 C415～C418 C701～C706 C723 C711 C715 C713 C709 C707 CE01～CE06 C717 CN01 CN02 CN03 CN04
	CV01～CV10 CJ01～CJ10 CG01～CG04 C724 C712 C716 C714 C710 C708 C718 CE07～CE12 C719～C722 C805～C807 C803 C804 C801 C802
Q－D	Q401 Q701 Q702 Q703 Q704 D701～D704 Q705～Q708 DN01 DN02 QN01～QN03 Q808 Q801 D803～D806 Q802 D802 DY51 QN04 D801
S－L－F	SS01 SG01 SE01 L701 L702



SCHEMATIC DIAGRAM(FA630/FA650)

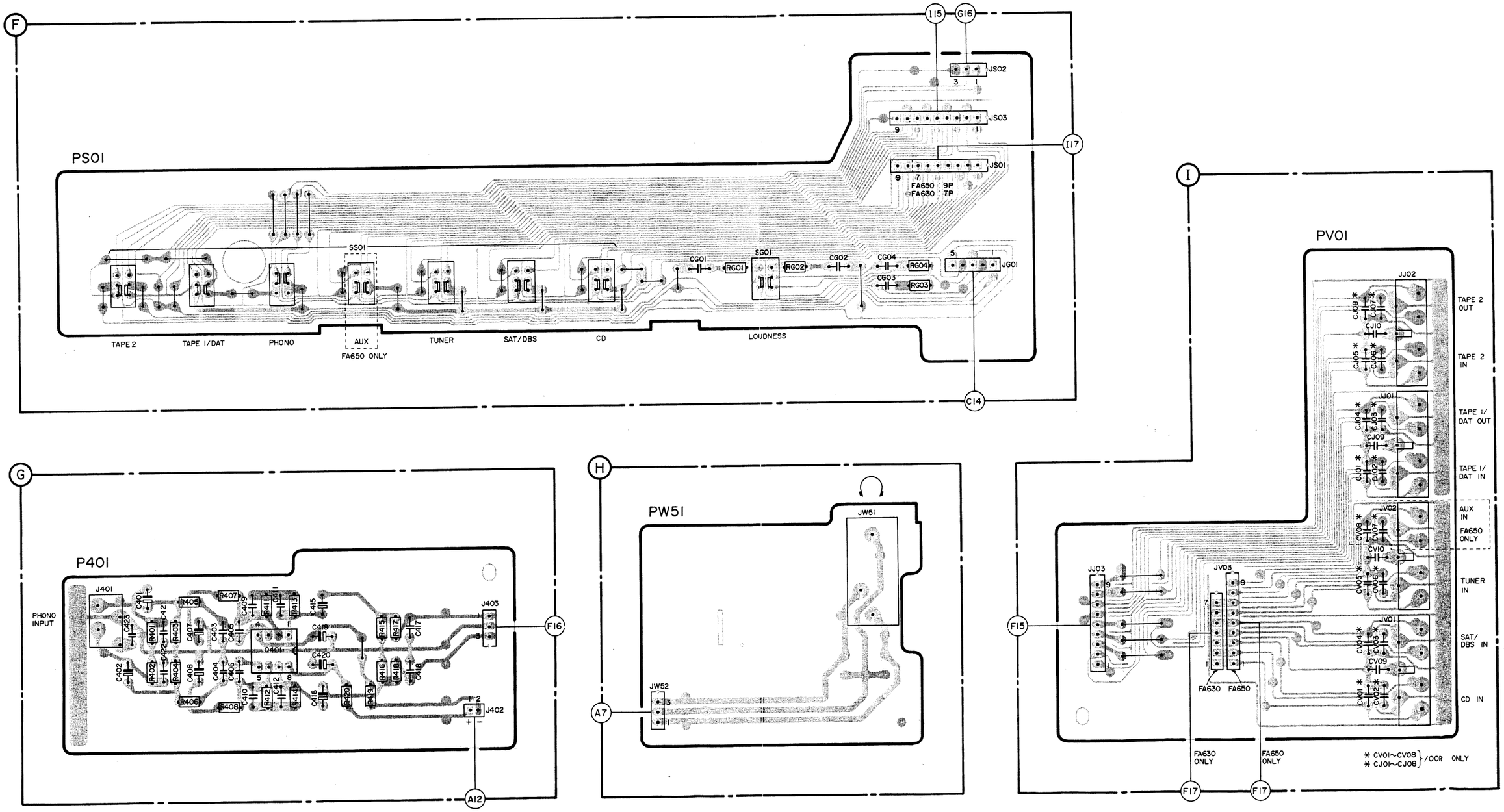


*	FA630	FA650
Q705	2SC3180	2SC3181
Q707	2SA1263	2SA1264
Q706	2SC3180	2SC3181
Q708	2SA1263	2SA1264
D801	S4VB-20	BR82

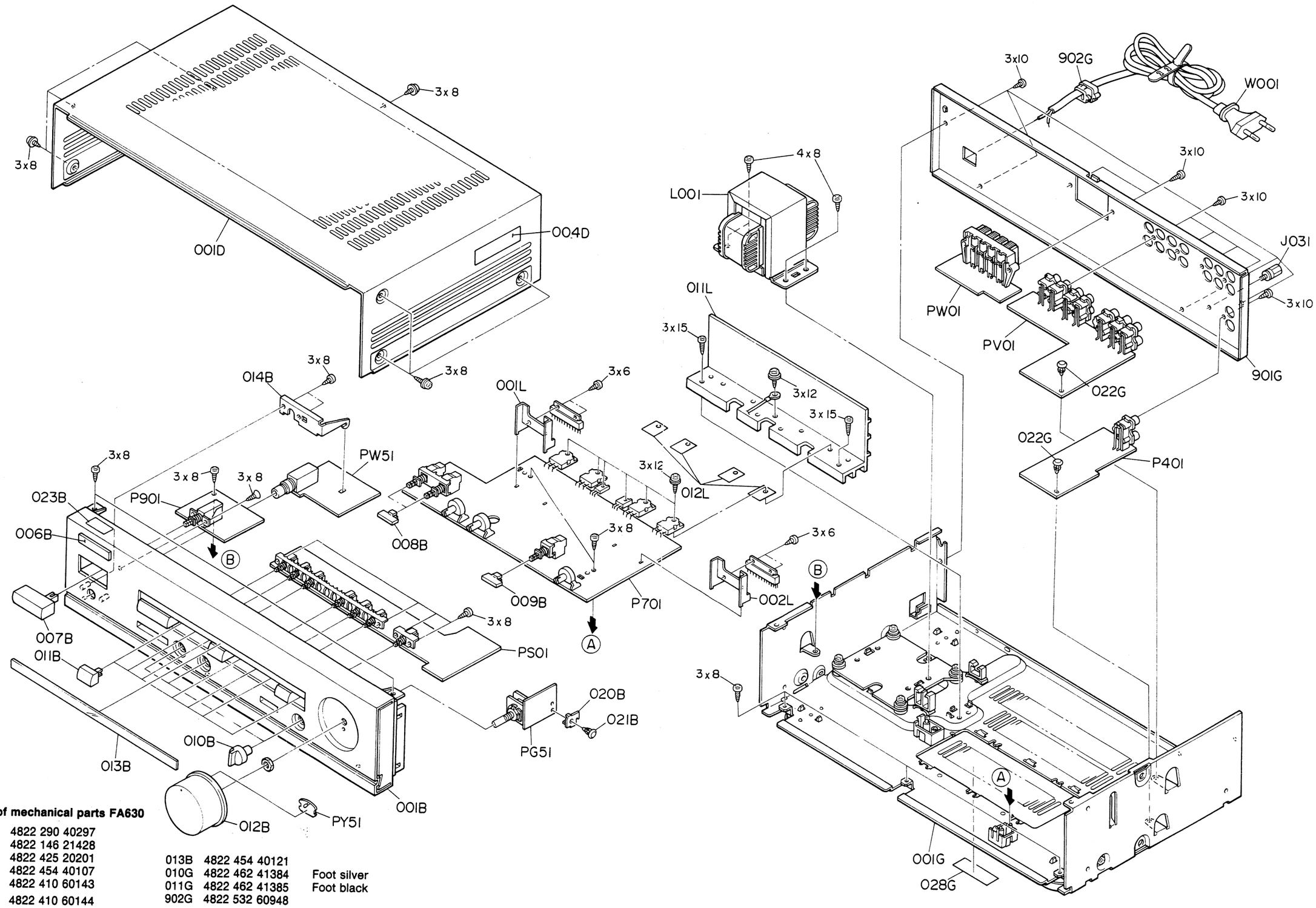
WIRING DIAGRAM(FA630/FA650)

R	R401～R406 R407 R408 R411～R414 R415～R420 RG01 RG02 RG03 RG04 CJ01～CJ10 CV01～CV10	R
C	C402 C401 C421～C423 C403～C408 C409～C412 C415 C416 C419 C420 C417 C418 CG01 CG02～CG04	C
Q	Q401	Q
S	SS01 SG01	S

COMPONENT SIDE VIEW



EXPLODED VIEW(FA630)

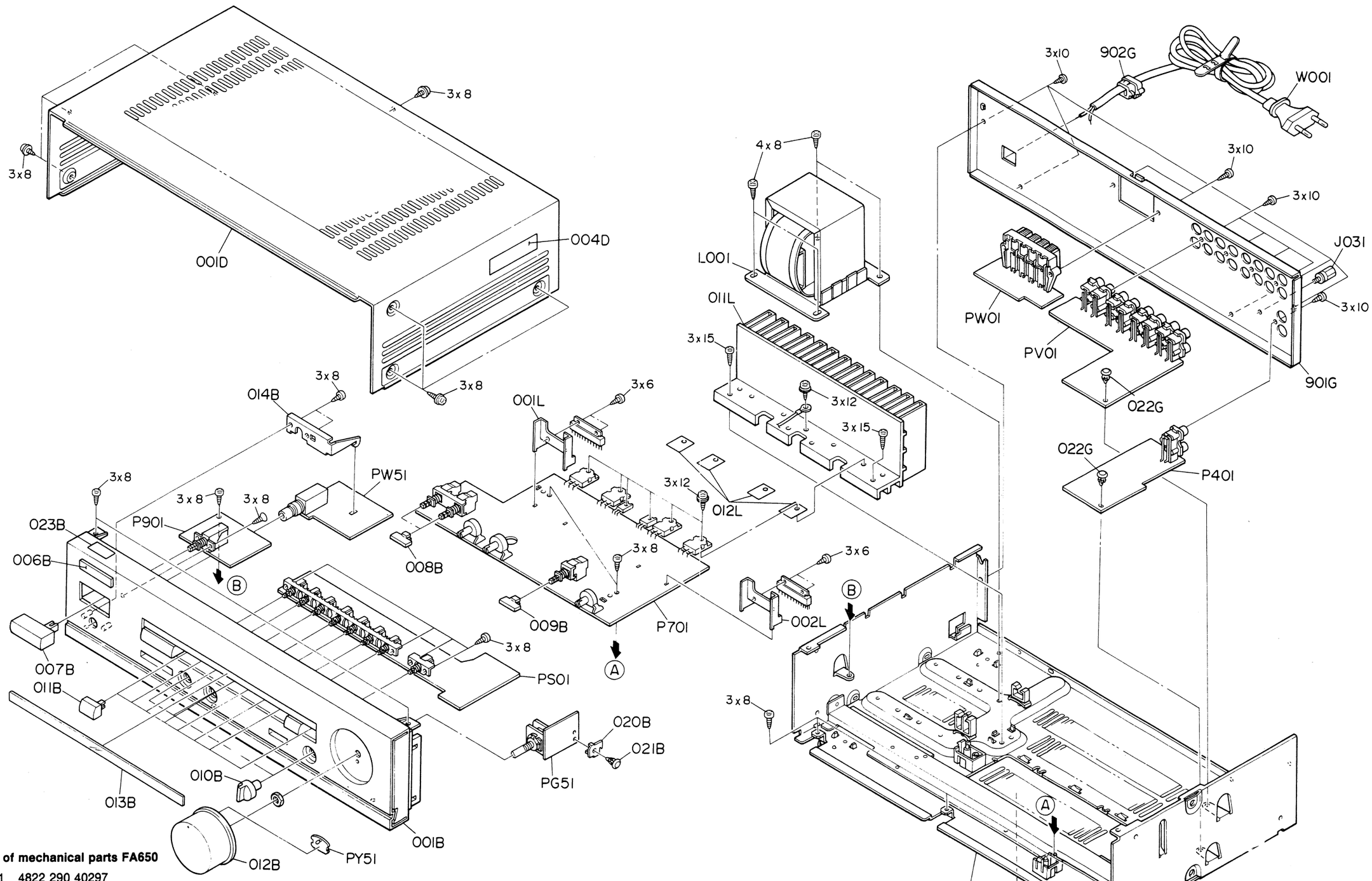


List of mechanical parts FA630

J031	4822 290 40297	
L001	4822 146 21428	
001B	4822 425 20201	
006B	4822 454 40107	
007B	4822 410 60143	
008B	4822 410 60144	
009B	4822 410 60144	
010B	4822 413 41523	
011B	4822 410 60145	
012B	4822 413 41522	
013B	4822 454 40121	
010G	4822 462 41384	Foot silver
011G	4822 462 41385	Foot black
902G	4822 532 60948	

Remark:
Only the parts provided with a service codenumber are available as service spare parts.

EXPLODED VIEW(FA650)



List of mechanical parts FA650

J031	4822 290 40297	
L001	4822 146 21429	
001B	4822 425 20202	
006B	4822 454 40107	
007B	4822 410 60143	
008B	4822 410 60144	
009B	4822 410 60144	
010B	4822 413 41523	
011B	4822 410 60145	
012B	4822 413 41522	
013B	4822 454 40122	
010G	4822 462 41384	Foot silver
011G	4822 462 41385	Foot black
902G	4822 532 60948	

Remark:
Only the parts provided with a service codenumber are available as service spare parts.

LIST OF ELECTRICAL PARTS FA630, FA650

C705	4822 124 22271	Cap. electr. 100 µF 35V	
C706	4822 124 22271	Cap. electr. 100 µF 35V	
C803	4822 124 21977	Cap. electr. 4700 µF 50V	
C804	4822 124 21977	Cap. electr. 4700 µF 50V	
C901	4822 122 33276	Cap. ceramic. 0.01 µF 400V	

RE23	4822 101 30628	Potm. 50K X2	
RE24	4822 101 30628	Potm. 50K X2	
RE25	4822 101 30627	Potm. 100K X2	
RG51	4822 101 30629	Potm. 50K X2	
RN15	4822 116 55263	Safety res. 820 Ω 1W	FA630
RN15	4822 116 63331	Safety res. 1K 1W	FA650
R709	4822 116 60318	Res. fusible 22Ω 1/4W	FA630
R709	4822 113 90119	Res. fuse 22Ω 1/4W	FA650
R710	4822 116 60318	Res. fusible 22Ω 1/4W	FA630
R710	4822 113 90119	Res. fuse 22Ω 1/4W	FA650
R711	4822 116 60318	Res. fusible 22Ω 1/4W	FA630
R711	4822 113 90119	Res. fuse 22Ω 1/4W	FA650
R712	4822 116 60318	Res. fusible 22Ω 1/4W	FA630
R712	4822 113 90119	Res. fuse 22Ω 1/4W	FA650
R717	4822 100 11373	Potm. trimmer 4.7K	
R718	4822 100 11373	Potm. trimmer 4.7K	
R725	4822 116 80171	Res. safety 0.18Ω 3W	
R726	4822 116 80171	Res. safety 0.18Ω 3W	
R727	4822 116 80171	Res. safety 0.18Ω 3W	
R728	4822 116 80171	Res. safety 0.18Ω 3W	
R729	4822 116 60246	Res. safety 220Ω 1W	
R730	4822 116 60246	Res. safety 220Ω 1W	
R731	4822 111 90726	Res. safety 10Ω 2W	
R732	4822 111 90726	Res. safety 10Ω 2W	
R733	4822 116 60262	Res. safety 330Ω 2W	
R734	4822 116 60262	Res. safety 330Ω 2W	
R801	4822 113 90141	Res. fuse 220Ω 1/4W	FA630
R801	4822 116 81748	Res. fuse 330Ω 1/4W	FA650
R802	4822 113 90141	Res. fuse 220Ω 1/4W	FA630
R802	4822 116 81748	Res. fuse 330Ω 1/4W	FA650

4822 130 42715	2SA608SP, 2SA1048, 2SA1309	
4822 130 61666	2SC3419 O,Y	
4822 130 42961	2SA1015 O,Y	
4822 130 60694	2SA1263 R,O	FA630
4822 130 43018	2SA1264 R,O	FA650
4822 130 61665	2SA1310 R or S	
4822 130 43197	2SC1815 O,Y	
4822 130 43233	2SC2240 GR or BL	
4822 130 60697	2SC3180 R,O	FA630
4822 130 61319	2SC3181 R,O	FA650

4822 209 83779	µP 1270H
4822 209 83631	NJM4558D-D
4822 209 83312	TA7317P

4822 130 81093	BR82	FA650
4822 130 80837	HSS81RX	
4822 130 80326	LT3D8B red	
4822 130 80498	RD16JB2, MTZJ16C	
4822 130 31007	S4VB-20	FA630
4822 130 33305	1SS176,MA165,1SS254	

Miscellaneous

F901	4822 253 30201	Fuse 1A 250V	FA650
F901	4822 253 20168	Fuse 800mA 250V	FA630
JJ01	4822 265 30397	Jack 4p	
JJ02	4822 265 30397	Jack 4p	
JV01	4822 265 30397	Jack 4p	
JV02	4822 267 30741	Jack 2p	FA630
JV02	4822 265 30397	Jack 4p	FA650
JW01	4822 267 50922	8p spk terminal	
JW51	4822 267 30617	Headphone jack	
J031	4822 290 40297	Ground terminal	
J401	4822 267 30741	2p RCA pin	
J901	4822 256 30329	Holder, fuse	FA630
J902	4822 267 30978	Holder, fuse	FA630
J903	4822 256 30329	Holder, fuse	FA650
J904	4822 267 30978	Holder, fuse	FA650
L001	4822 146 21428	Transf. mains	FA630
L001	4822 146 21429	Transf. mains	FA650
L701	4822 157 51739	Coil, choke	
L702	4822 157 51739	Coil, choke	
LN01	4822 280 70354	Relay 5A/240V AC	
SE01	4822 276 12595	Switch, pushbut.	
SG01	4822 276 12596	Switch, pushbut.	
SS01	4822 276 70107	Switch, pushbut.	
S701	4822 276 20477	Switch, pushbut.	
S901	4822 276 11898	Switch, pushbut.	